DEVELOPMENTS IN INFOGRAPHICS

Murray Dick

> Evan Davis: “Let me bring up a graph...”
> Russell Brand: “I don't wanna look at a graph mate, I ain't got time for a bloody graph... this is the kind of stuff people like you use to confuse people like us.” (BBC Newsnight 2014: 8.57-9:15)

Infographics are a constant presence in media today. They adorn the pages of national and regional newspapers around the world; they are popular across quality, mid-market and tabloid formats and they are routinely found in our TV news. They are especially popular online, where freely available software make it possible for anyone to create slick-looking charts. It has been suggested that news stories with infographics can generate up to 30 times more pageviews than stories without (So 2012). The search term “infographic” has been steadily rising in popularity since 2009, and is predicted to continue rising beyond 2015 (Google.co.uk 2015).

How can we make sense then, of the rise of the infographic? Scholarship in the field of visual culture offers one possible explanation. Television, it is argued, is pervasive; we are constantly appraised by video surveillance, and our modern life, work and leisure are mediated by visual media. Today, it is argued, our lives are best understood by means of this visual media, just as the nineteenth century is best understood by means of its newspapers and novels (Dikovitskaya in Heywood and Sandywell 2012). After the “visual turn” then, the significance of infographics in our news and journalism acquires a new significance.

Elsewhere, other academic fields offer a research basis that may explain the increasing popularity of the form in news. Picture Superiority Effect, a theory derived from empirical studies in cognitive psychology, shows that concepts learned using pictures are recalled more easily and more frequently than their equivalent expressed in word-form (Paivio and Csapo 1973). Infographics offer news media a means of establishing a more lasting impact on their audiences than text alone.

Today’s graphic design professionals are more confident, and in-demand than once they were in the news industry (Dick 2014). Infographic design (where static) and development (where interactive) is the work of various specialisms, as reflected in the wide variety of job-titles that now exist in the newsroom, including: interactive news developer, programmer/data specialist, software developer, data scientist, multimedia producer, and interactive producer. The emergence of these new roles coincides with a working culture at leading media companies that actively privileges interactive (and hence visual data) journalism. In 2014, The Guardian merged its visual journalism, data journalism and audience development teams, inspired by examples from native digital start-ups, in order to enhance its digital output (Reid 2014). In the same year, the BBC established its Visual Journalism Unit, a working structure that integrates designers and journalists across broadcast and online mediums (BBC.co.uk 2014).

A host of awards, including new categories within traditional journalism awards, now exists to recognised excellence in infographic design, including; The Society of News Design Malofiej Awards (since 1993); The Online News Association Online Journalism Awards (since 2000); The Best of Digital Design, Formerly known as the SND.ies, (since 2002); and the Global Editor's Network Data Journalism Awards (since 2012). The range of participants and winners in some of these awards offers an insight into the rise of the form globally. In 2012 alone, works by 154 different media companies from 28 countries were submitted to the Malofiej awards (Malofiejgraphics.com 2011). American and Spanish media tend to dominate this particular contest (and in particular the New York Times), nonetheless there exists a spread of talent in the field that extends globally; the current year's awards saw gold medals for South China Morning Post (3) and

Times of Oman (2) (Malofiejgraphics.com 2015).

For their advocates, the infographic (when designed responsibly and well) represents a highly functional means of communicating data efficiently to a wide audience (Tufte 1983; Tukey 1990; Cairo 2012). However, when designed badly infographics can become a dangerously seductive means of deceit (Dick 2015). The use of graphs to prove a point in argument is considered by some a modern form of sophistry; a visual manifestation of lies, damned lies and statistics; the big lie that belies big data. How then can we reconcile the evident distrust this medium evokes in some, with the fact that it is today a highly specialised, professionalised and firmly established manifestation of modern, networked news?

Infographics in Journalism Studies literature

Scholarship on infographics in the field of Journalism Studies falls broadly into three categories:

1. Studies of how users interact with infographics in news
2. Content analyses of infographics in news
3. Organisational studies concerned with the role of the visual journalist in the newsroom

The first of these categories comprises research concerning; the transgression of standards in newspaper infographics (Reavy 2003); why audiences read particular infographics (Pasternack and Utt 1990; Prabu 1992); and the perceived dualism of visual attraction and understanding in audience engagement (Stone and Hall, 1997). The second of these categories comprises case studies and surveys concerned with the use of infographics in American (Smith and Hajash 1988; Utt and Pasternack 2000), United Arab Emirates (Bekhit 2009) and Indian (Ghode 2012) newspapers. The third category is largely the product of one scholar: Wilson Lowrey (1999; 2002; 2003). Situated within an organisational studies approach, Lowrey's research problematizes the creation of textual/visual journalism in the context of the conflicting norms held by competing professional sub-groups in the newsroom.

Notable by its absence in this literature is a critical account of the problem of public trust in news infographics. Here I will explore this issue by setting out a series of competing (and at times overlapping) approaches to definitions, standards, and theorization in infographic design.

What is an infographic?

Infographics come in many forms; bar charts, pie charts, histograms, pictograms, statistical maps, process diagrams, experimental visualizations, or composites of any (or all) of the above, and more. So what, if anything, can we say collectively defines them?

The rudimentary (common-sense) definition of an infographic is formalistic; it is predicated on the compounding of the terms “info” and “graphic”. Alternatively, some definitions include an additional purposive dimension:

“Charts, graphs, maps, diagrams and tables whose primary function is to consolidate and display information graphically in an organized way so a viewer can readily retrieve the information and make specific and/or overall observations from it.” (Harris 1999: 198)

Today Infographics are largely associated with mass media and with the notion of making concepts easily understandable (OED Online 2006). In the practitioner literature, definitions tend to separate infographics according to those that serve decorative and informational ends (hence “flavour” or “fact or information”) with the use of informational, or sign systems seen as the key distinction

between “illustrations” and “graphics” (Evans and Taylor 1997: 289). Moreover, some practitioners compound the term in order to draw out a more particular meaning; for example, Nigel Holmes prefers the term “explanation graphics” (1994).

From definitions to standards

Some definitions of infographics are manifest in typological approaches to the form. A normative list of graphical forms (with accompanying standards of best practice) is presented in British Standard 7581 (1992). It comprises:

- Table
- Bar graph
- Line graph
- Area graph
- Pie graph
- Isotope graph
- Scatter graph
- Histogram
- Three-dimensional graph
- Superimposed graph
- Thematic map
- Illustrated graph, and;
- Pictorial graph.

This approach may be considered the latest (or rather one of the latest) in a series of attempts to set out universal standards for the visual presentation of data.

The need for infographic standards first emerged during the second half of the nineteenth century, in the context of a perceived need to limit the “babelisation” (Palsky, 1999) arising from inconsistencies in scientific practice across European borders. However, it would take until the second decade of the twentieth century before the first formal manifestation of rules around infographic design would emerge in the US (Brinton 1914; 1915). These early standards remain useful (and broadly relevant) today, but in some respects they are problematic. For example, The American Society of Mechanical Engineers' first principal of graphic presentation states that: “The general arrangement of a diagram should proceed from left to right.” (Brinton 1915: 791). Functionalist perceptual theories like this, that take no cognisance of the contexts in which media are consumed, tend to ignore affective reasoning, and the cultural expectations different audiences hold (Brasseur, 2003: 18). This is problematic because experiments in cognitive psychology show that representations of temporal concepts are influenced by directionality of written language (for example, where left-to-right is found to be dominant for speakers of English, and right-to-left is found to be dominant for speakers of Arabic) (Tversky, Kugelmass and Winter 1991). In short, far from being universal, this approach unduly privileges the Western mind-set.

Elsewhere, in relation to time-series charts, Brinton's fourth principle states: “If the zero line of the vertical scale will not normally appear on the curve diagram, the zero line should be shown by the use of a horizontal break in the diagram” (Brinton 1915: 792). But there is no allowance here made for those who would adhere to strict application of the rules, while misleading in other ways. For example, the use of a vertical line break across variables in time-series charts is a misleading method commonly found amongst early tabloid news infographics in the UK (Dick 2015). This omission suggests a certain naivety; these early guidelines are directed merely at correcting (well-intended) misuse.

Standards in infographics: competing narratives

In the absence of internationally agreed standards today, best practice in infographic design is instead subject to a range of competing (and at times overlapping) approaches; and it is between and amongst these approaches that an informed understanding of infographics is best understood. Here I will set out four discourses that may be detected (to varying degrees) amongst the guides and text books that shape debate about infographics:

- Functionalist-idealist;
- Pragmatist-realist;
- Expressionist-aesthete, and;
- Didactic-persuasive.

In doing so, I will outline how argumentation between these positions creates space for a deeper (and more nuanced) understanding of the value of infographics in our news; that goes some way to explaining the diverging views on the form that exist today.

Functionalist-idealist

The first of these discourses, the functionalist-idealist, is largely critical of newspaper infographics. It is most clearly articulated in the works of statisticians, mathematicians and scientists, and in particular Edward Tufte (1983; 1997); though elements may also be found in the works of Willard Cope Brinton (1914, 1915, 1939), Darrell Huff (1954) and John Allen Paulos (1996). For Tufte, graphics necessarily deal in complex, "multivariate" (1983: 51) ideas (even if news does not), and they must explain clearly and efficiently: "telling the truth about the data" (1983: 51). The notion that designer and audience may not share a common and irreducible understanding of what "the truth" means, is not countenanced here. This discourse is unapologetically positivist, Tufte states: "If the statistics are boring, then you've got the wrong numbers" (1983: 80). Yet some have long questioned the lack of evidence behind Tufte's claims and norms, and not least the suitability of his approach to infographics in news (Prabu, 1992).

In turn, Tufte expresses a low opinion of newspaper graphics: lies in these, he argues, are: "systematic and quite predictable, nearly always exaggerating the rate of recent change" (1983: 76). This criticism dovetails with some political economy critiques of news values more generally, and the undue emphasis placed on events and "news hooks" in mainstream coverage (McChesney, 2000). In this reading the rise of the infographic represents not so much an appeal to universalism per se, but rather a means of satisfying an international and rapacious audience of "clicks" seeking out "news you can use", which in turn embodies the utilitarian short-sightedness of modern, globalised online news.

Tufte presents a (perhaps tongue in cheek?) method of verifying the "truth" of infographics:

> Lie factor = size of effect shown in graphic/size of effect in data (1983: 57)

It should be noted that Tufte's approach is not without its detractors from within the mathematical-statistical field. For example, it has been argued that Tukey's (1990) emphasis on the impact of graphical display, poses a direct challenge to Tufte's Bauhausian minimalism (Wainer 1990: 341). This graphical fidelity/graphical impact dichotomy represents a point of departure to the second discourse.

Pragmatist-realist

This discourse finds voice, by degrees, in the work and thoughts of infographics practitioners working in the news, including; Peter Sullivan (1987), Nigel Holmes (1994), Alberto Cairo (2012) and Dona Wong (2013). This approach involves conceiving of infographics as "visual journalism", and standards in this field are drawn both from traditional, liberal journalistic ethics and values, as well as the positivist canon that informs the first discourse.

For Sullivan space is an invitation to experiment and move beyond statistical charts, into the realms of imaginative visual form (Sullivan 1987: 41). In turn, the availability of white space (in newspapers) he considered directly proportional to the potential for graphical story-telling. Sullivan was concerned with the audience that is, not the audience that ought to be (practitioners, after all, have a material interest in ensuring the audience understands their work). His designs at The Sunday Times speak to the shortcomings he perceived in the wider UK education system, in terms of instilling graphical literacy in the wider population.

In this view infographics are a tool or a technology (Cairo, 2012) rather than a communicative abstraction. This approach emerges out of the contested professional and organisational values found in the newsroom (Lowrey 1999). It accommodates practical realities; publication schedule, audience need and constraints on materials and resources, as constraints upon infographic production. Best practice is constructed as part of an ongoing debate – something that requires constant vigilance. In 2011 international coverage of the "raid" on Osama bin Laden's compound in Abbottabad, Pakistan inspired so many wildly misleading infographics that practitioners sought to define the integrity of the medium publicly. In an open letter to Nieman Watchdog, Juan Antonio Giner and Alberto Cairo (supported by a number of other visual artists and experts) set out a six-point charter of ethical considerations graphic artists should aspire to, to obviate poor, misleading (even propagandistic) coverage in future (Niemanwatchdog.org 2011).

Expressive-aesthetic

The third discourse, expressive-aesthetic, is informed by both post-modern thought and by fin de siècle aesthetic sensibilities, and may be detected in the graphical work (and thinking) of one of today's infographic "superstars" – David McCandless. For McCandless, the potential in infographics is bound up in expressive experimentalism, with a premium on aesthetics, and an emphasis on the importance of play (Torran 2015) and fun. McCandless' approach represents a challenge both to the positivism of the functionalist-idealist, and to the pragmatist-realist liberal ideal of journalism as fourth estate:

"I'm interested in how designed information can help us understand the world, cut through BS and reveal the hidden connections, patterns and stories underneath. Or, failing that, it can just look cool!" (McCandless 2009)

This approach foregrounds aesthetic impact at the expense of all other considerations. As such, it is subject to criticism within both the first and second discourses; prompting one media critic to question (rhetorically) whether it is "the illegitimate pop culture offspring of real analysis" (Maitlis, 2012: 1:53-1:57). Nonetheless, the pioneering aspects of this approach is popular amongst some in the media industry (Dick 2014).

Didactic-persuasive

A fourth discourse in infographics, what may be called the didactic-persuasive approach, is given clearest expression in the work of logical positivist Otto Neurath and his artistic collaborators in 1930s Vienna. His pioneering ISOTYPE "picture language" embodies a key organising design

principle in pictograms; namely that the repeated use of figure icons affords a means of achieving graphic fidelity better than re-sizing icons. This fourth discourse has long been criticised amongst statisticians as being unduly reductive, at the expense of full numerical accuracy (Burke 2013:197), and it is distinct from the others in so far as it conceives infographics as being ideologically purposive. ISOTYPE was intended to inform a socialist conception of adult education (Hartmann 2006: 279), within the wider struggle for a fairer (socialist) society (Hartmann: 2006: 280). The idea of purposive infographics didn't necessarily begin with Neurath - some of the most celebrated infographic pioneers (including Florence Nightingale), it has been suggested, were more concerned with affecting persuasion in their intended audience, than with explaining reality "objectively" (Small, 1998).

"Chartjunk": Good or bad?

Tufte coined the pejorative term "chartjunk" to define (or rather to condemn) infographics with, on his terms, a high "lie factor":

"Lurking behind chartjunk is contempt both for information and for the audience. Chartjunk promoters imagine that numbers and details are boring, dull and tedious, requiring ornament to enliven...Credibility vanishes in a cloud of chartjunk; who would trust a chart that looks like a video game?...Disrespect for the audience will leak through, damaging communication" (Tufte 1997: 34).

Recent empirical studies do not support this position. On the contrary, audiences often prefer (Inbar et al 2007), can better recall (Bateman et al 2010) and are in any case not necessarily hindered from interpreting (Blasio and Bisantz 2002) data in "chartjunk" form. Nevertheless, the concept of "chartjunk" continues to shape debates around infographics. One of the most intractable of these debates, stretching back at least as far as Brinton (1914: 5), concerns the use of circles, circular data presentations and proportional circle graphics (Christiansen 2011). At the heart of this debate lies a tension in infographic design; the balance between maintaining the fundamental integrity, and accuracy of visual display, and the need to engage the viewer (or audience) in the data. At the BBC today this tension is keenly felt, not least because the corporation has a stated duty (bound by Royal Charter) to appeal to all of the public, not just a select demographic. Internal research at the corporation has shown that a proportion of the public are entirely off-put by charts due to unhappy memories of studying mathematics at school, while on the other hand, circles are considered much more visually appealing (Dick 2014). This debate in turn raises an interesting paradox with regards high and low forms in journalism; complicating the perceived differences between populist (or tabloid) and quality coverage; between dumbed down content, and fourth-estate, public interest journalism.

Guardian.co.uk's Tax Gap interactive (2009), an interactive tool intended to help the audience obtain a comparative sense of the tax liabilities of FTSE 100 companies, embodies this paradox. Though purists may question the integrity (or rather, the lack of interpretive potential) in the use made of proportional circles in this interactive, it is clear that the mode of presentation lends itself well to engaging the public in the esoteric (perhaps even dull) process of comparing company financials. It may indeed be argued that the same information displayed in small multiples of bar graphs would not be nearly so engaging for a wide sweep of the reading public; thus limiting the story's full civic potential.

On the other hand, in terms of the more populist form of news infographics, the fun and (in some cases) frivolous stories found in online media brands like Ampp3d.com (started in December 2013) represent the latest (online) manifestation of tabloid "explanatory" journalism, which found earlier expression in Time Magazine (during the 1990s), the Daily Mirror's Mirrorscope (of the late 1960s), The Daily Express's "Expressographs" (from the 1950s onwards); and the Isotype-influenced

“Telefact” range of infographics published by Pictorial Statistics Inc in 1930s America.

Here “chartjunk” is notable by its absence– on the contrary, most infographics employed in this medium bear the mark of traditional, minimalist graphic displays (many are unadorned bar graphs and fever charts). In eschewing visual bells and whistles, the debate about what is “tabloid” in this form of journalism, is not so much a matter of form as of content. Data journalists at quality newspapers and educators have criticised some of the tabloid data journalism emerging from media like Ampp3d.com (Ball 2014) and FiveThirtyEight.com (Cairo 2014); questioning the news values and journalistic integrity in the construction of these stories, but not necessarily the graphical formats used.

Today we see quality press employing what may be termed “chartjunk” (or tabloid) characterisations in their use of infographics; whereas those tabloid sources online now tell sensational (occasionally erroneous, even misleading) news stories using sober, simple, standardized graphical configurations. Here "chartjunk" has been interpolated into the ideal of classic liberal, fourth-estate journalism, while functionalist-idealist best practice has been interpolated into tabloid infographic news coverage.

Future directions

In 2010 the then President of The Society for News Design, Kris Viesselman, observed a recent shift away from narrative illustrated graphics, towards statistic-rich, data-driven visualizations (Datajournalism.stanford.edu 2009: 4:42-4:54). This took place in the context of newly available data sources at the time; driven in the first instance by national governments (both data.gov and data.gov.uk were launched in 2009), allowing new opportunities for investigation and exploration to emerge. However, today it is argued that the general level of creativity in these large-scale data visualizations has slowed, due to the absorption of creative talent into the (conservative) organisational norms of industry. (Wilson 2015). Where lies the truth here? And what types of news are most commonly expressed in infographic form? Are there any emerging trends, and if so what do they say about modern news? All of these issues merit further empirical research.

The integrity of (and audience engagement with) infographics in contemporary, networked media poses a serious civic challenge. In America, the Association of College & Research Libraries has argued that the visual nature of modern lived culture is “changing what it means to be literate in the 21st century” (Ala.org 2011). As modern life is increasingly saturated with images, and infographics (both static and interactive), and as these images mediate our lived experience (and our democratic engagement), how can we be sure that the public has the critical faculties to interpret, critically appraise and make sense of it all? There is much demand for more empirical studies of audience engagement with news infographics. Moreover, a critical history of infographics, setting out the emergence of the form as a modern communicative medium would go some way towards informing scholarship (and policy) in this field.

Conclusion

Today infographics are a popular form in our news, and their purpose and function is subject to tensions between several competing discourses. One of the most intractable problems arises out of a conflict between a form of positivist puritanism that foregrounds and idealises communicative fidelity, and a form of pragmatic populism that is concerned with balancing professional and organisational norms with the needs of the modern mass media audience. Though infographics may at first glance seem a relatively new (and under-studied) field in wider journalism studies, it is nevertheless possible to discern traces of earlier themes and issues here; such as the tabloidization debate of the 1990s.

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Word count

4978

Biography

Murray Dick lectures in multimedia journalism at Newcastle University, UK. His research interests are primarily concerned with journalistic practice, but also include: sociologies of online journalism and of visual data journalism (infographics), information management, journalism history and

journalism pedagogy.